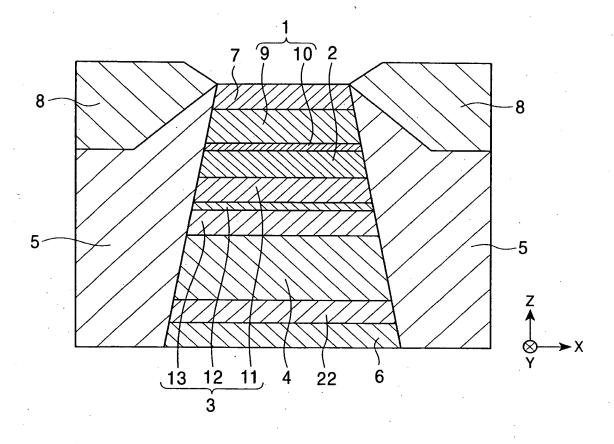
FIG. 1



 $2 \angle 20$

FIG. 2

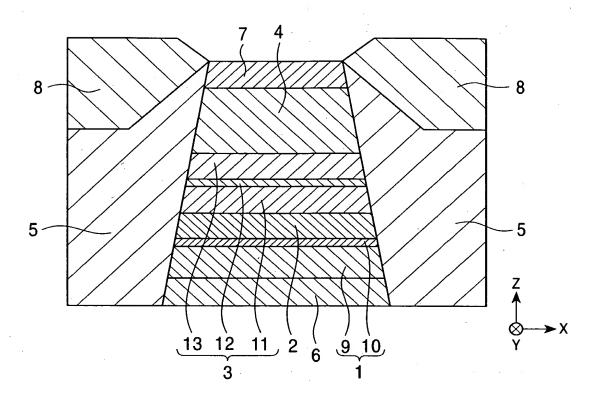
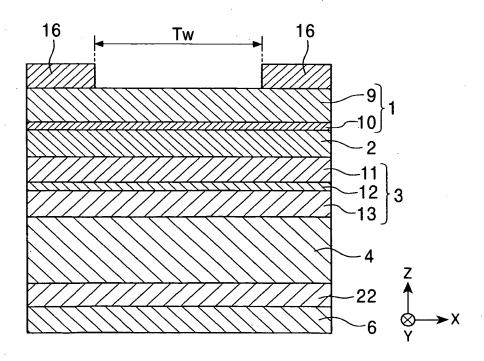


FIG. 3



the Same

FIG. 4

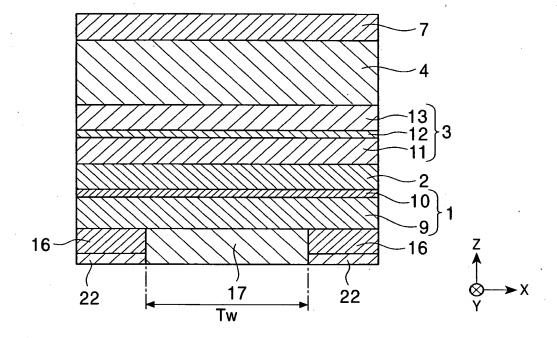


FIG. 5

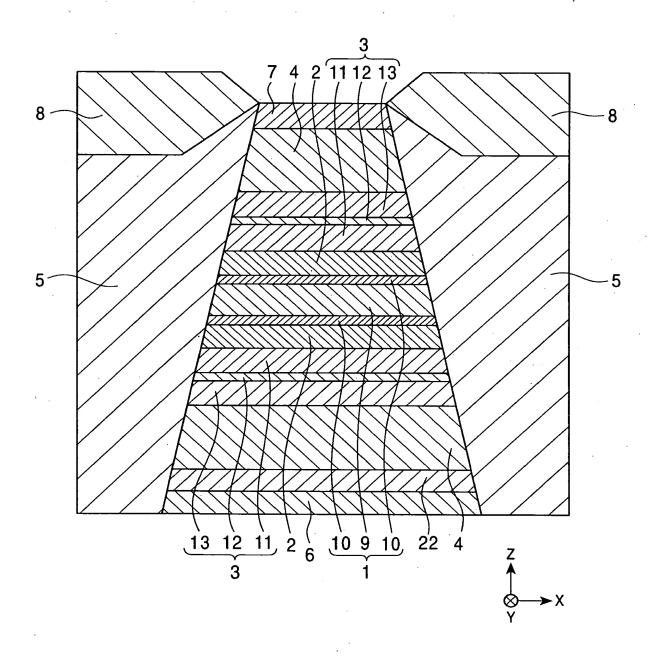




FIG. 6

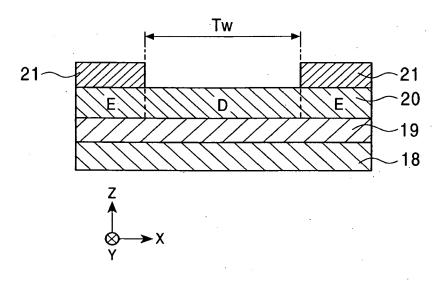
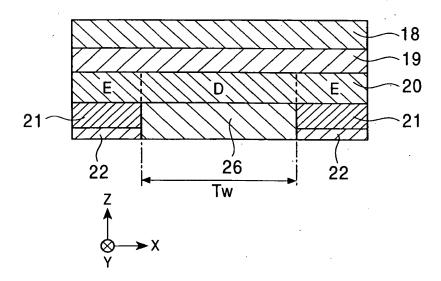
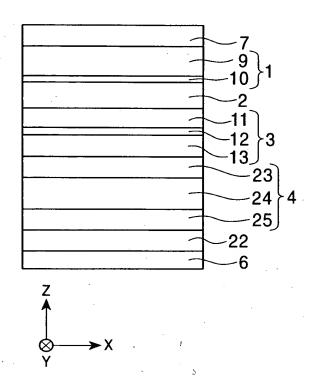


FIG. 7



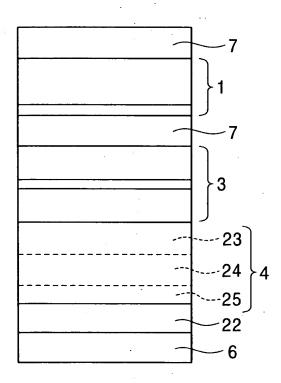
 $6 \angle 20$

FIG. 8



THEOTH SERDINGE

FIG. 9



he Same

FIG. 10

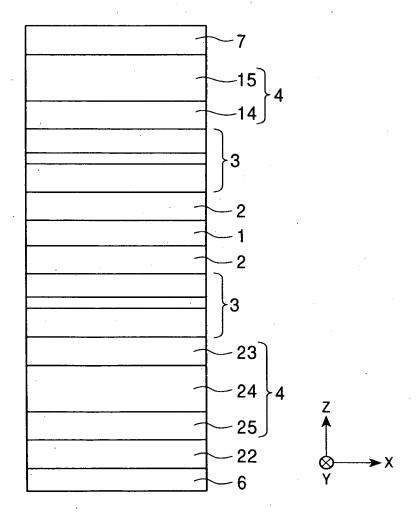
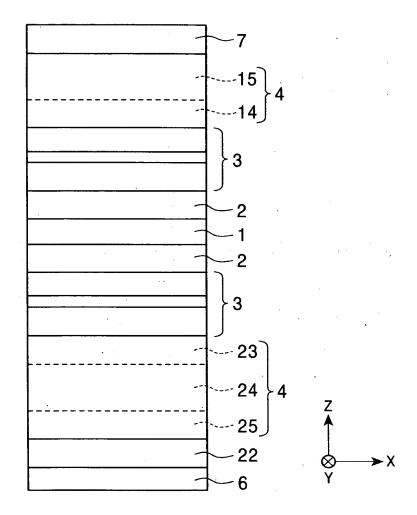


FIG. 11



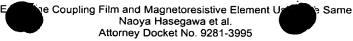


FIG. 12

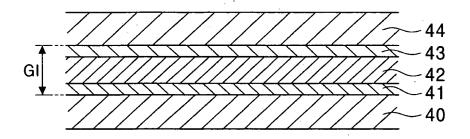
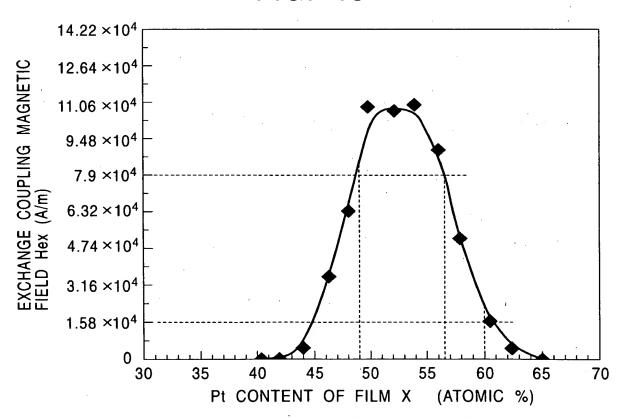


FIG. 13



FILM STRUCTURE: Si SUBSTRATE/ALUMINA/Ta(3nm)/NiFe (3nm)/PtMn(15nm)/Co

(1.5nm)/Ru(0.8nm)/Co (2.5nm)/Cu(2.3nm)/Co

(1nm)/NiFe(3nm)/Cu(1.5nm)/Ta(3nm)

Same

FIG. 14

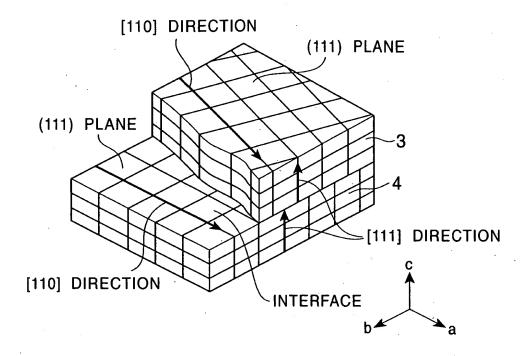


FIG. 15

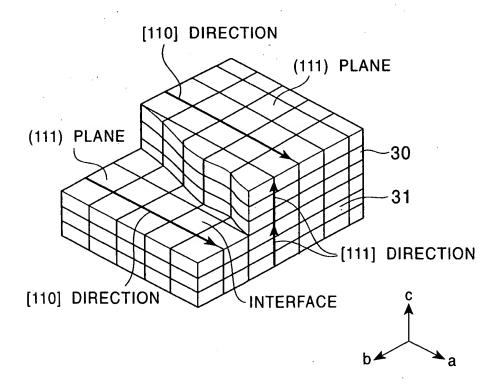
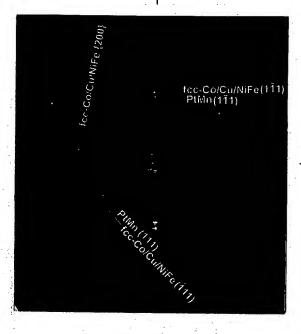


FIG. 16

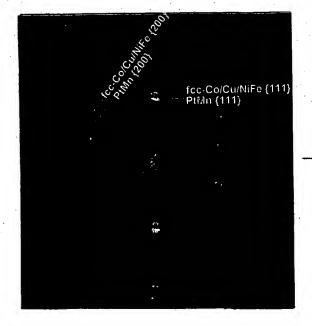
THICKNESS DIRECTION



FILM PLANE (TRANSVERSE) DIRECTION

FIG. 17

THICKNESS DIRECTION



FILM PLANE (TRANSVERSE) DIRECTION

FIG. 18

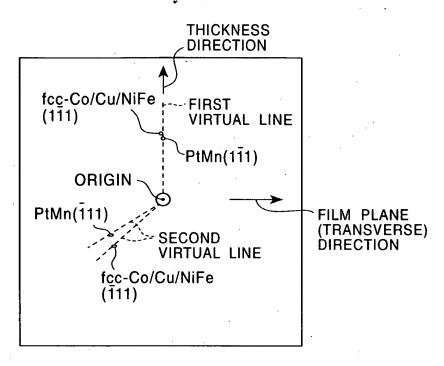
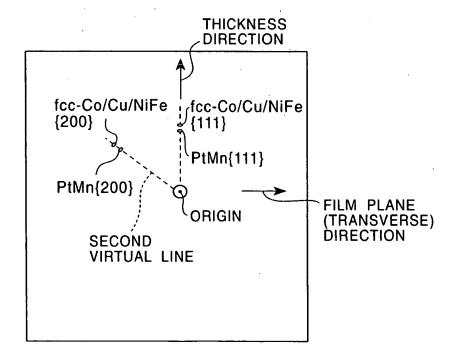


FIG. 19



Same

FIG. 20

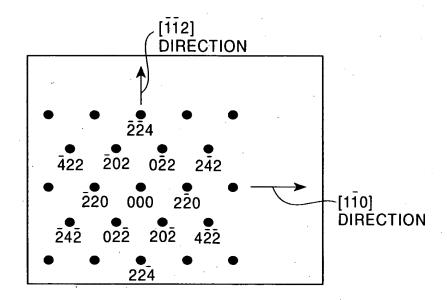


FIG. 21

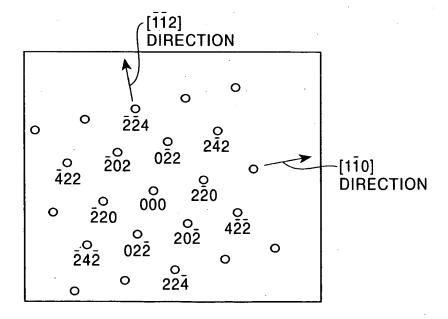


FIG. 22

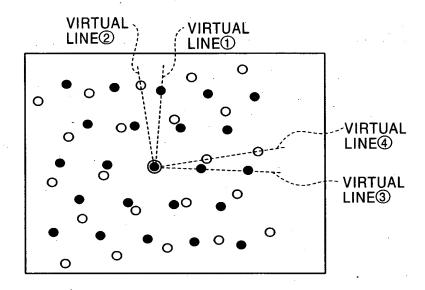
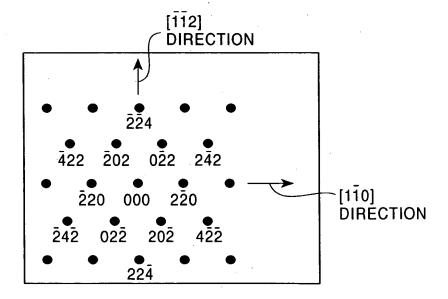


FIG. 23



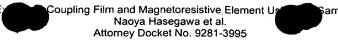


FIG. 24

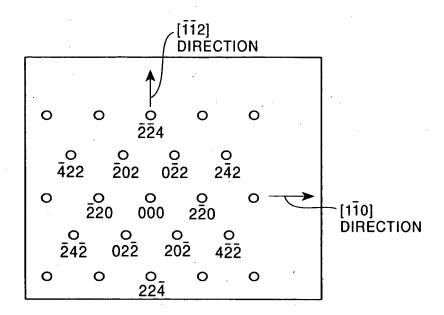
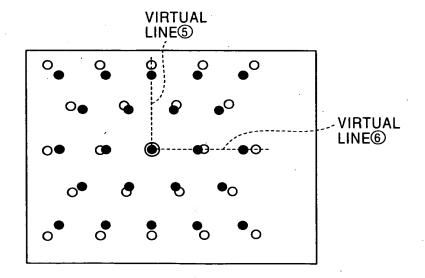


FIG. 25



nge Coupling Film and Magnetoresistive Elemy
Using the Same
Naoya Hasegawa et al.
Attorney Docket No. 9281-3995

 $17 \angle 20$

FIG. 26

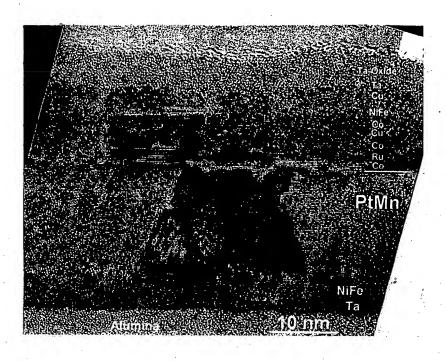


FIG. 27

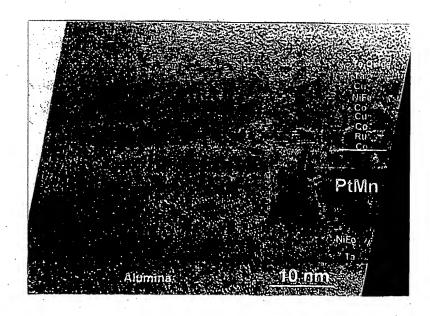


FIG. 28

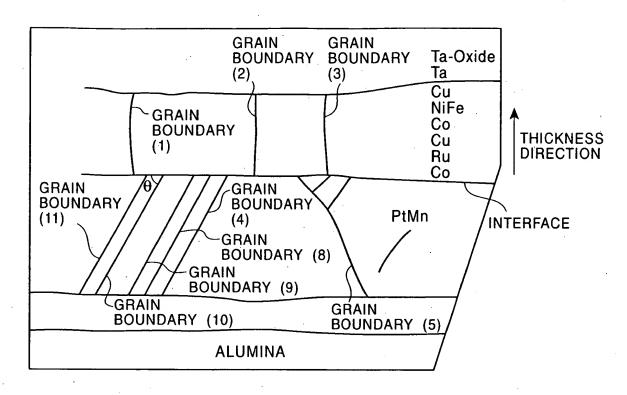
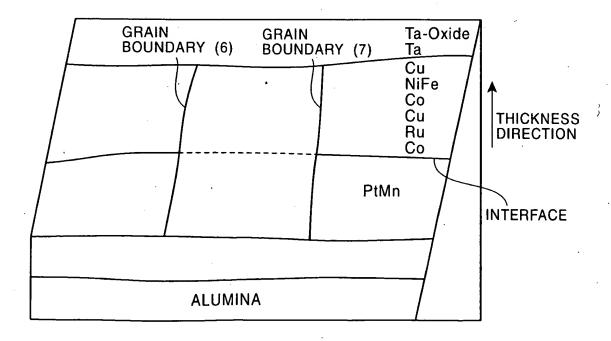


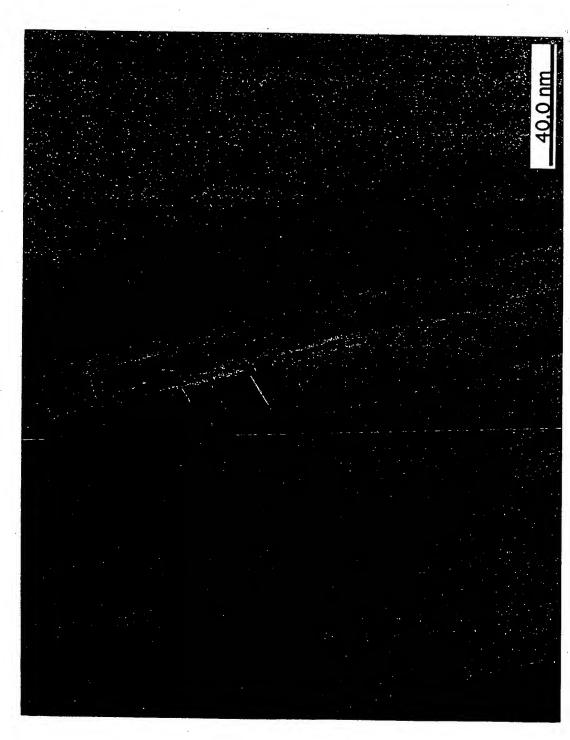
FIG. 29



ge Coupling Film and Magnetoresistive Elemer
Using the Same
Naoya Hasegawa et al.
Attorney Docket No. 9281-3995

19 / 20

FIG. 30





PtMn {111} PLANE ORIENTATION (111) PLANE ORIENTATION -GRAIN BOUNDARY INTERFACE ₩ TWIN BOUNDARY GRAIN BOUNDARY GRAIN BOUNDARY